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| 10/581,328 | 06/01/2006 | Georg Muhlthaler | WUE-60 | 3182 |
| 7590 | 12/06/2010 | | EXAMINER | |
| Thomas J Burger Wood Herron & Evans 2700 Carew Tower 441 Vine Street Cincinnati, OH 45202-2917 | | | GREEN, RICHARD R | |
| | | | ART UNIT | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/581,328 | MUHLTHALER ET AL. |
| | Examiner | Art Unit |
| | Richard R. Green | 3644 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 24 September 2010.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 19,21,22 and 27-32 is/are pending in the application.

4a) Of the above claim(s) 19,21,22 and 28 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 27 and 29-32 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Election/Restrictions

Newly submitted claims **19, 21, 22 and 28** are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The inventions of the newly amended claim 19 and of the originally presented claims are directed to related products. The related inventions are distinct if: (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the inventions as claimed have materially different designs. Amended independent claim 19 is drawn to a piping system including a closed pipe having a conveyance section composed of only one passageway, such as shown in any of figures 1, 2, 4 or 5. Independent claims 27 and 30 are drawn to the invention shown in figures 6 and 7, which features a closed circuit piping system having feed and discharge lines, as well as a cold storage unit. Furthermore, the inventions as claimed do not encompass overlapping subject matter and there is nothing of record to show them to be obvious variants.

In the first Office action of 4/30/2008, the claims acted upon were those filed 3/7/2007, where claims 13-17 dependent from claim 1 are drawn to the invention shown in figures 6 and 7, having a piping circuit and a cold storage unit, and no claims were drawn to the invention of the closed pipe.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims **19, 21, 22 and 28** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **27 and 29-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,658,881 to Plattner in view of U.S. Patent 6,481,228 to Chiang et al.

Regarding claim 27: Plattner teaches in figs. 1 and 7A-D an aircraft (16) having a cooling device (14) for expelling heat from a heat source (the cabin interior) located in the interior of the aircraft to a heat sink (the outside air), comprising:

a piping system (pipes of fig. 1) sealed against the surrounding atmosphere (c. 2, l. 47-65: the air conditioning system is a dual phase refrigerant cycle) having a heat intake section (22) thermally coupled with the heat source, a heat output section (12) thermally coupled with the heat sink, and an essentially adiabatic conveyance section located therebetween, whereby the piping system is filled with a heat conveyance medium which, when heat is received in the heat intake section from the heat source,

undergoes a transition from the liquid phase to the gaseous phase, then flows into the heat output section, then condenses when discharging heat to the sink, and then flows back to the heat intake section (c. 2, l. 47-65);

wherein said heat sink includes a section of an internal wall of the aircraft (fig. 2B; c. 3, l. 14-19: the back wall 28 of the condenser enclosure is mounted directly to the skin of the aircraft); and

a cold storage unit (18) provided between the heat source and the heat sink, the cold storage unit collecting cooled liquid phase heat conveyance medium (c. 2, l 23-27: "receiver/dryer 18 stores the liquid refrigerant") for use when cooling requirements are increased, such as when the aircraft is on the ground (the stored refrigerant is considered capable of use at such times).

Plattner fails to teach a regulation device operatively connected to a ventilator and regulation valve to control the transfer of heat between a heat exchanger of the piping system and the heat source and to control the quantity of heat conveyance medium flowing to or from the heat exchanger.

Chiang teaches in fig. 23:

a heat exchanger (30) for an evaporator of a cooling device (c. 5, l. 41-50), which is operatively connected to a ventilator (40);

a regulator valve (such as at 38) operatively connected to the piping of the evaporator to control the quantity of heat conveyance medium flowing to or from the heat exchanger (c. 6, l. 38-57: various valves are taught for controlling the quantity of refrigerant flow);

a temperature sensor (41) located adjacent the heat source (in the region of the evaporator/heat intake section) so as to detect the temperature thereof, the temperature sensor operatively connected to the cooling device so that the cooling device can respond to the temperature detected by the temperature sensor; and

a regulation device (42) operatively connected to the ventilator and to the regulator valve so as to control the ventilator and regulator valve according to the temperature detected by the temperature sensor (c. 6, l. 28-35: "By regulating the speed of the blower 40, the flow rate of the heat transfer medium or the speed of the compressor ... the supply air temperature can be controlled"; see also c. 7, l. 13-26).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use the heat exchanger of Chiang, including its ventilator, regulator valve, temperature sensor, and regulation device, with the evaporator of Plattner, for the purpose of controlling the heat transfer at the evaporator.

Regarding claim 29: the piping system of Plattner forms a closed circuit which connects the heat source and sink via a feed line and discharge line (see fig. 1).

Regarding claim 30: Plattner teaches embodiments placing the heat output section on top of the fuselage (figs. 7A-D) and on the bottom of the fuselage (figs. 8A-D), though Plattner fails to teach using both in the same embodiment. However, it would have been obvious to a person having ordinary skill in the art at the time of the invention to duplicate the cooling system of Plattner with units on the top and bottom in order to provide a greater cooling capacity, for example on flights in unusually hot environments.

Regarding claim 31: when the aircraft is in a rest condition, the heat sink is located geodetically higher than the cold storage unit (see for example figs. 7A-7D, where the condenser is located on the top of the aircraft). Plattner is silent as to the location of the evaporator relative to the reservoir 18. However, the electronics would have to be located geodetically lower than a location on top of the aircraft, and it would have been obvious to a person having ordinary skill in the art at the time of the invention to place the evaporator near to the electronics, and moreover to retain the general relative arrangement of fig. 1, keeping the reservoir between the evaporator and condenser, to minimize the length of piping required.

Regarding claim 32: Plattner in view of Chiang provide the invention of claim 27, as described above. Plattner further teaches a step of storing cooled liquid phase heat conveyance medium in the receiver/dryer while the aircraft is flying (c. 2, l. 47-65: "receiver/dryer 18 stores the liquid refrigerant ... as the refrigerant circulates within the air conditioning system 14"). Plattner is silent to a specific step of releasing stored liquid refrigerant from the receiver/dryer to the heat source, however, the receiver/dryer continually releases at least some liquid refrigerant during normal operation, otherwise no fluid would reach the evaporator.

Response to Arguments

Applicant's arguments filed 9/24/2010 have been fully considered but they are not persuasive.

Applicant has argued that there is no reason to combine the disclosures of Plattner and Chiang due to their different applications of aircraft and computer cooling (Remarks, page 10). Applicant argues that Chiang is directed towards a computer cooling system which is not closed loop and is not for the entire space of the room.

Plattner and Chiang are both in the shared field of cooling systems, and so the art is analogous and one of ordinary skill in the art looking to improve upon the invention of Plattner would certainly have looked to the art of cooling systems in general and not only to the specific art of aircraft cooling systems, particularly since there is nothing substantial which separates aircraft cooling systems from other cooling systems. The relevant teachings of Chiang relied upon for rejection are that of a heat exchanger, regulator valve, temperature sensor, and regulation device which operate in concert to regulate the heat exchange rate taking place in the heat input section. These elements would all operate similarly in a larger, closed loop system, and there would be no significant barrier to one of ordinary skill in the art to apply these teachings to the invention of Plattner.

Applicant has argued that the receiver/dryer of Plattner is not a cold storage unit, since it would not store a very large quantity of fluid (Remarks, pages 11-13). However, a receiver/dryer inherently stores fluid when it is not needed, such as when cooling requirements are low, and a receiver/dryer legitimately meets the limitations of the claimed cold storage unit. The cold storage unit of the invention may have a greater storage capacity than a receiver/dryer, but neither the amount of liquid stored/released

nor the degree of cooling provided by the released refrigerant is claimed. It is noted that claim 27 recites the function of storing refrigerant as a statement of intended use.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard R. Green whose telephone number is (571)270-5380. The examiner can normally be reached on Monday - Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Collins can be reached on (571)272-6886. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. R. G./
Examiner, Art Unit 3644
/Tien Dinh/
Primary Examiner, Art Unit 3644